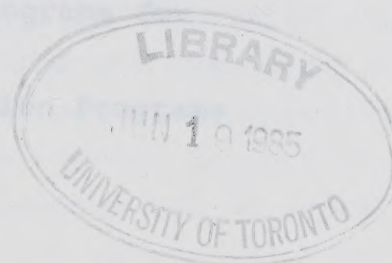Technical Study 11
LABOUR ADJUSTMENT: AN
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POLICIES
Graham Glenday and
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This is one in a series of technical studies prepared
for the Task Force on Labour Market Development. The
opinions expressed are those of the author and do not
necessarily reflect those of the Task Force. They do
not reflect the views of the Government of Canada.

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ABSTRACT

LABOUR ADJUSTMENT: AN OVERVIEW OF PROBLEMS AND POLICIES

Graham Glenday and Glenn P. Jenkins

This paper provides an overview of labour adjustment situations in Canada, the incentives to adjust from the perspective of the workers and the costs and benefits to the economy of different labour adjustment problems and policies. Conceptual models and estimation procedures for arriving at the costs and benefits of various adjustment programs are discussed. Where possible actual estimates are presented or referenced to give the dimensions of adjustment problems and potential gains from adjustment policies.

The paper is divided into three sections. The first covers regional disparities in employment growth and the role of migration. Across Canada, employment during the 1970s grew at rates ranging from a high in Alberta of almost 5 per cent per year to a low in Manitoba and Quebec of about 2¼ per cent per year. Such disparities can lead to regional labour market disequilibria in terms of labour in general or specific skills. It is not necessary for all workers to be mobile to bring about rapid labour market adjustment. Those willing to move to high-demand regions leave behind less competition for vacancies in low-demand regions. An analysis of the seemingly small net migration rates at the provincial level (averaging less than 1.5 per cent per year) is provided to show their important role in reducing these disparities. Net migration rates can be expected to be sensitive to regionally differentiated government programs that change the relative attractiveness of both employment and unemployment between regions. Government programs can be seen to help (mobility grants), substitute for (slow-growth region

investment incentives and job programs) or hinder
(unemployment insurance) inter-regional labour market
adjustment.

The second section deals with "upside" adjustment
problems and policies: situations where demand is growing
faster than anticipated, leading to unexpectedly high vacancy
rates in a region or for a specific skill. The situation of
skill shortages and training responses is used to develop the
concepts of the sources of potential economic gains from
government programs that attempt to substitute for or promote
the normal operations of the labour market adjusting supply
to meet demand. Potential economic gains from promoting more
rapid adjustment increase with (i) the size of the skill
shortage, (ii) the short-run rise in the wage rate for the
specific skill, (iii) the training time per skilled worker,
(iv) the persistence of the shortage (v) the size of any
positive labour externalities generated by incremental
employment of skilled workers and (vi) the economic
cost-effectiveness of any program to capture the market
surplus and labour externalities earlier. Where shorter,
job-specific technical training is involved, the government
could tie funding to training institutions to their placement
records to encourage responsiveness of training programs to
changing demands. Where long-term professional and
high-skill institutional training is highly dependent on
government funds, the onus for direction also falls on the
government. If immigration dries up as a source of highly
skilled labour, then the burden falls on the government to
identify and deal with supply problems stemming from their
funding and regulatory practices.

The final section of the paper deals with the "downside" labour adjustment problem that arises as the demand for labour in certain sectors contracts, leading to layoffs. Changing international competitiveness provides a constant impetus for adjustment of resource allocation in an economy. Many labour-intensive industries (clothing, knitting, textiles, footwear and electrical products) have found it increasingly difficult to compete with imports. These sectors have received tariff and non-tariff trade protection as well as direct assistance to maintain employment levels. Labour adjustment problems and policies in these sectors provide the focus of this section. Sources of income loss of workers laid off from these industries are reviewed and estimates of the losses based on analysis of labour force tracking data are given. Compensation payments could break the political link between trade protection and lack of adjustment to changing international economic circumstances.

The nature and costs of labour adjustment from an economy-wide perspective and the policies to reduce these costs are also investigated. There are two approaches: to assist firms about to lay off workers to stay in business and, hence, delay adjustment costs, or to promote re-employment of laid-off workers. Both approaches are discussed in detail.

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ADAPTATION DE LA MAIN-D'OEUVRE: APERÇU DES
PROBLÈMES ET DES POLITIQUES

Graham Glenday et Glenn P. Jenkins

L'étude donne un aperçu des divers cas d'adaptation de
la main-d'oeuvre au Canada, des incitations à l'adaptation
du point de vue des travailleurs touchés et du coût et des
avantages, pour l'économie, d'un certain nombre de problèmes
et de politiques concernant l'adaptation de la main-
d'oeuvre. Les auteurs y présentent les modèles conceptuels
et les méthodes utilisés pour calculer les coûts et les
avantages de divers programmes d'adaptation. Dans la mesure
du possible, ils ont fourni des estimations réelles ou y
renvoient le lecteur pour illustrer l'ampleur des problèmes
d'adaptation et les gains possibles à retirer des politiques
en la matière.

Le corps du texte se divise en trois sections. La
première traite des disparités régionales de la croissance
de l'emploi et du rôle de la migration. Si l'on regarde
l'ensemble du Canada, on constate que dans les années 1970
la croissance de l'emploi a culminé à près de 5 % par année
en Alberta et atteint le niveau le plus bas, c'est-à-dire
quelque 2,25 % par année au Manitoba et au Québec. De
telles disparités peuvent entraîner des déséquilibres
régionaux du marché du travail pour la main-d'oeuvre en
général ou pour certaines compétences. Il n'est cependant
pas nécessaire que tous les travailleurs soient mobiles pour
que l'on puisse réaliser rapidement l'adaptation du marché
du travail. Les travailleurs qui sont disposés à aller
travailler dans les régions où la demande est forte
diminuent par le fait même la concurrence pour les postes
vacants dans les régions où la demande est faible. Une
analyse des taux provinciaux de migration nette qui sont
apparemment faibles (s'établissant en moyenne à moins de

1,5 % par année) permet aux auteurs de montrer le rôle important que ces taux jouent pour atténuer les disparités. On peut s'attendre que les programmes gouvernementaux, adaptés à chaque région et qui contribuent à modifier l'attrait relatif de ces régions sur les plans de l'emploi et du chômage, influent quelque peu sur les taux de migration nette. On peut estimer que les programmes de l'État aident (subvention à la mobilité), remplacent (incitations à l'investissement dans les régions à faible croissance et programmes de création d'emplois) ou empêchent (assurance-chômage) l'adaptation inter-régionale du marché du travail.

La deuxième section traite des problèmes et des politiques d'adaptation "à la hausse", c'est-à-dire les cas où la demande s'accroît plus rapidement que prévu, ce qui entraîne un taux de postes vacants inopinément élevé dans une région où une profession particulière. Les auteurs se servent des données relatives aux pénuries de compétence et aux programmes de formation pour disserter sur les gains économiques éventuels que l'on pourrait tirer des programmes gouvernementaux qui visent à remplacer ou à promouvoir le fonctionnement normal du marché du travail, c'est-à-dire à adapter l'offre à la demande. Les gains économiques que pourrait entraîner la promotion d'une adaptation plus rapide augmentent selon i) l'importance de la pénurie de main-d'oeuvre; ii) l'augmentation à court terme du salaire offert dans une profession particulière; iii) le temps de formation par travailleur spécialisé; iv) la persistence de la pénurie; v) l'ampleur de tout facteur externe positif lié à la main-d'oeuvre et suscité par les emplois additionnels créés pour les travailleurs spécialisés, vi) la rentabilité économique de tout programme permettant de tirer parti plus rapidement des facteurs externes liés aux excédents du marché et à la main-d'oeuvre. Lorsqu'il s'agit d'une formation technique plus courte et davantage axée sur

l'emploi, il semblerait plus indiqué pour le gouvernement
d'accorder des fonds aux établissements de formation en
fonction du nombre de placements qu'ils suscitent afin
d'amener ces établissements à aligner davantage leurs
programmes sur les nouveaux besoins. Dans les cas où la
formation professionnelle à long terme en établissement est
fortement tributaire des fonds de l'État, il revient à
celui-ci, dans une certaine mesure, de paver la voie. S'il
n'est plus possible de répondre à la demande de
main-d'oeuvre spécialisée même par l'entremise de
l'immigration, il incombe au gouvernement d'identifier et de
faire face aux problèmes d'offre liés à l'orientation des
programmes de financement et aux règlements.

La dernière section de l'étude porte sur le problème
d'adaptation "à la baisse" qui se pose lorsque les secteurs
compriment leur demande de main-d'oeuvre, ce qui entraîne
des licenciements. L'évolution de la concurrence
internationale commande constamment une adaptation de la
répartition des ressources au sein d'une économie. Bon
nombre des industries à forte concentration de main-d'oeuvre
(vêtement, tricot, textile, chaussure et produits
électriques) éprouvent de plus en plus de difficulté à
soutenir la concurrence des importations. Ces secteurs ont
bénéficié de protections tarifaires et non tarifaires ainsi
que d'autres formes d'aide directe pour maintenir leur
niveau d'emploi. Cette section s'attache surtout à
examiner les problèmes et les politiques d'adaptation de la
main-d'oeuvre dans ces secteurs. On y examine les sources
de manque à gagner des travailleurs licenciés en plus de
donner, à partir de l'analyse de données sur l'expérience
des travailleurs licenciés de ces industries, des
estimations à ce chapitre. Le versement d'indemnités
pourraient faire éclater le lien politique entre le
protectionnisme et le manque d'adaptation à l'évolution de
la conjoncture économique internationale.

Les auteurs se penchent également sur la nature et les coûts de l'adaptation de la main-d'oeuvre envisagés sous l'angle de l'économie, de même que sur les mesures visant à réduire ces coûts. Les deux méthodes relevées consistent soit à aider les entreprises, sur le point de licencier des travailleurs, à poursuivre leur activité, ce qui aurait pour effet de reporter les coûts de l'adaptation, soit à promouvoir le réembauchage des travailleurs licenciés. Ces deux méthodes sont étudiées en détail.

1.   INTRODUCTION

Labour markets and workers are continually adjusting to changing economic circumstances. A significant proportion of workers change jobs every year. Some are switching jobs voluntarily as they seek career improvements in new job opportunities. Some voluntarily quit work and either spend a period unemployed as they seek new employment or leave the labour force for a time to attend to household duties, to return to school, recover from illness or injury and so on before becoming re-employed again. Other workers are laid off, often involuntarily, and hence, seek alternative employment.[1,2] Many workers also move between regions or change occupations and industries between jobs.[3,4] Therefore, the labour market context within which any particular group of workers may be required to undertake some adjustment due to a plant shutdown, for example, is quite a fluid one.

Adjustment problems arise because of fixed costs or sticky prices in the short run. In the labour market workers incur fixed costs as they make investments in acquiring skills, either on the job or in formal institutions, gathering information on job opportunities, choosing among the opportunities or moving to reside in specific locations based on their expectations of labour market opportunities. A miscalculation can mean the need for time consuming reinvestment if the job opportunities fall short of expectations - the worker is in a "downside" adjustment situation. Alternatively, the worker can experience a windfall gain as job opportunities exceed expectations - an "upside" adjustment situation. If this underestimation

of the net benefits is widespread in the labour market then other workers can be expected to move to take advantage of the unexpectedly favourable opportunities. Downside problems for a labour market arising from major layoffs, for example, can be exacerbated by sticky wages and slow reinvestment of released capital which hinder the re-employment of the laid-off as well as other unemployed workers. For the economy as a whole, an adjustment problem is worse, the more workers miscalculate (i.e., market expectations are not fulfilled by a wide margin), the slower the adjustment process (i.e., the more time consuming the investments required for adjustment), and the larger the market externalities (i.e., costs or benefits not internalised in the calculations of the workers or firms directly involved in the adjustment to unexpected market circumstances).

The sources and situations of labour adjustment are numerous. Any particular industrial sector can be experiencing an unexpected expansion or contraction in its demand for labour for many reasons: shifting consumer tastes, technological innovations leading to new product lines or production techniques, changing international competitiveness of the domestic industry, discoveries of new stocks of exploitable natural resources or exhaustion of old stocks, or changing levels of government assistance (such as trade protection, tax credits or direct assistance). Regions in turn can be expected to display differential growth rates in demand for labour as a result of their differing concentrations of expanding and contracting industries. Within any region, therefore, an ever-changing mix in the demand for labour skills is expected. More important, however, is the changing demand for labour across regions,

both in terms of aggregate numbers of workers required and the mix of skills.

During the 1980s Canada faces a number of major adjustment problems.

(i)   Problems arising out rapid expansion of demand for labour are being experienced by the Western Provinces as they move into the exploitation of natural resources. This is a problem of meeting the demand for manpower in general, but more particularly, it is a problem of shortages of certain occupational skill categories such as engineers and skilled tradesmen.[5] Similar problems can be predicted for Newfoundland when it begins exploiting its offshore energy resources.

(ii)   The automobile industry in Central Canada can be expected to experience adjustment problems for a number of years as it restructures in response to a changing market. This industry is a major user of skilled labour, particularly in parts production. For its successful recovery it requires adequate supplies of skilled labour. If it contracts, it represents a major source of skilled labour to other firms in the goods-producing sectors.

(iii)   New international fishing treaties are expanding the economic opportunities for the Canadian fishing industry. This will require changes in the numbers and types of fishermen.

(iv)   Canada has developed innovative and internationally competitive products in the electronics, aerospace,

communications, and transportation sectors. The
effective exploitation of these depends upon an
adequate supply of highly skilled manpower.

(v)   The service sector can be expected to continue to
supply a large number of low-wage, low-skill jobs.
This sector also contains a major and growing stock of
human capital such as that in the consulting,
financial, computing, and educational sectors. The
introduction of computer-based office equipment can be
anticipated to have major impacts on the labour
requirements in the financial services sector.

(vi)   Some sectors are faced with problems of a continuing
decline in international competitiveness. Among the
import-competing sectors the labour-intensive sectors
such as clothing, knitting, textiles, assembled
electrical products, and footwear have lobbied for
high levels of tariff and non-tariff protection and
other forms of government assistance. These sectors
are regionally concentrated in Quebec and to a lesser
extent in Ontario. The loss of competitiveness within
these sectors is expected to continue, if not become
more severe. The less-developed countries,
particularly those in Asia, are continually
developing their production and marketing capacities
and capabilities, which restrains rapid growth in
world prices of these products that would provide a
more favourable economic environment for Canadian
domestic production. From a domestic perspective,
these sectors tend to provide low-wage employment
which can be expected to become increasingly less
attractive to the more skilled and educated workers
found in increasing numbers among the younger age

groups of the labour force. Such workers can be expected to prefer more attractive and productive jobs that pay higher wages. Jobs in the clothing and knitting sectors, for example, pay on average only two-thirds of the average wage level while textile sector jobs pay approximately four-fifths of the average.[6] The contraction of these industries results in an adjustment problem that is regionally concentrated and centred on older, high seniority workers.[7]

(vii) Among the export-oriented industries the pulp and paper sector is struggling to maintain its international competitiveness against countries with warmer climates where forests grow more rapidly. A rapid pace of technological innovation is required to maintain its competitive position.

(viii) The exploitation of non-renewable natural resources commonly leads to adjustment problems upon exhaustion of the economically exploitable stock. The closure of a mine in an isolated region provides an adjustment problem for many of the displaced workers. The high degree of certainty of eventual closure, however, often results in the risks of adjustment being passed on to the mine-owners. The housing of the workers may belong to the mine-owners, for example.

The remainder of this paper is divided into three sections. The first deals with regional disparities and the role of migration. The second discusses severe upside adjustment problems and possible approaches to deal with them, while the last section covers the downside adjustment problem and reviews some estimates of the adjustment costs. The upside problem essentially implies unexpectedly high

vacancy rates in a specific region or for a specific skill, while the downside problem arises out of unexpectedly high unemployment rates. Some further comments are directed at the general nature of these topics before entering these separate sections.

Given the vast physical dispersion of the Canadian labour force, the regional concentration of many of the Canadian labour market adjustment problems, and the importance of at least a subset of a labour market displaying high mobility, it seemed appropriate to focus on the regional dynamics of the provincial labour markets over the 1970s. It is important to note that it is not necessary for all workers to be mobile to bring about rapid adjustment. The mobile indirectly assists the immobile whether their mobility is between regions, industries, or occupations. Those who are willing to move leave less competition for the limited number of job vacancies left open in a region, industry, or occupation to those who find adjustment more costly. This suggests that, in general, adjustment is expected to be a problem limited to a subset of workers or labour market situations. Section 2 focuses specifically on geographic mobility, and the important role of what appear to be relatively small net migration rates in reducing problems arising out of regional disparities in the growth of employment opportunities.

Labour adjustment is an ongoing general problem in the operation of markets. It is useful, however, to analyse separately severe upside problems arising from unexpectedly rapid growth in labour demand and severe downside adjustment problems from unexpected rapid contraction of labour demand. These areas are more visible and provide scope for larger potential gains from specific government interventions. The

downside problem, such as that arising in the context of
trade liberalization, is generally considered the thorniest
adjustment problem from both a political and an economic
perspective. Hence, a more extensive treatment of this topic
is provided.

As with any government intervention or policy, both the
economic efficiency and distributional effects are of
concern. The aggregate change in income for all Canadians
and how these changes are distributed across different groups
of economic actors - consumers, workers, capital-owners,
income groups, regional groups, directly and indirectly
affected persons, and so on - are the estimation problems for
adjustment policy analysis. In general it seems reasonable
that government policies that increase aggregate well-being
should be promoted, and hence, a primary focus of the
analysis is always the efficiency effects or the net economic
benefit of a policy. The complete delineation of the costs
and benefits of a policy to all persons or groupings is
generally difficult, costly, and not necessary.

It is important, however, to recognize the incidence of
the costs and benefits of a policy where either or both are
highly concentrated, leading to strong advocacy groups for or
against a policy change. Concentrated benefits, but
dispersed costs can lead to strong lobbying by the
beneficiaries for government actions that may well be
negative in aggregate efficiency. For example, an industrial
association may lobby for extensive public funding for
training in skills specific to, or useful only, in that
industry.

Alternatively, concentrated costs but dispersed benefits can lead to opposition to efficiency-positive moves. The perceived adjustment costs arising out of trade liberalization have led to strong and effective protectionist lobbying from the directly affected sectors. Another example is the introduction of labour-saving technology innovations which invariably elicit strong protests from the directly-affected groups. Ideally all policies would result in all winners and no losers, or alternatively, if compensation programs had neither transactions nor long-run efficiency costs, losers would always be compensated. We do not live in such an ideal world, however, and governments generally undertake policies where the visible costs to the losers are not perceived to be politically damaging. Hence, where the costs are concentrated on a politically sensitive and effective group, failure to take account of these private losses and offer compensation for them results not only in these costs being avoided, but more importantly, also in losing the efficiency gains by the policy change being blocked in the political arena. In a downside adjustment situation such as plant shut-down, for example, where the government is being lobbied to either not remove protection or to increase protection to alleviate an adjustment problem, there will be many potential losers (the laid-off workers, as well as homeowners and indirectly affected workers if there is a sectoral or regional contraction.) It is a matter of political judgment concerning how widely the compensation net needs to be thrown. The types and scope of income losses from layoffs are discussed, but most attention is devoted to the directly affected workers and the economy as a whole in presenting adjustment costs in this paper.

In the case of upside adjustment problems, such as a severe shortage of some type of skilled labour, both workers and employers have incentives to adjust. Workers are interested in capturing the rents implicit in the higher market wages induced by the shortage, while employers have incentives to cut labour costs and expand output to increase their profits from the new market opportunities that are generating the increased labour demand. The speed and extent of their adjustment will be reduced if they are unable to capture all the benefits of expansion. The existence of external labour market benefits may provide justification for government actions to promote both the rate and extent of adjustment. As with the downside adjustment situation, the political process is unlikely to be supportive of rapid adjustment, but for different reasons. In upside situations, an unfilled vacancy is less politically visible and persuasive (the voter is not yet employed) than in the case of laid-off workers. Furthermore, vacancies may also be regionally and sectorally dispersed so that no pro-lobby group is established, and where they are concentrated, an anti-rapid-growth lobby group may well spring up.

Labour adjustment policies can usefully be viewed as either aimed at promoting the speed of adjustment which reduces the short-run or transitional costs, or intended to alter the extent of adjustment which affects the long-run costs and benefits. In the trade-liberalization/labour-adjustment context it is apparent that there is a linkage between the short-run adjustment costs of workers and the long-run equilibrium benefits of the economy. Furthermore, some adjustment policies will affect both the short-run and long-run situations. For example, a portable wage subsidy can be expected to both increase the rate of re-employment of workers as well as affect the stability and amount of future

employed time. In general, such dual purpose adjustment
policies are of more interest than policies dealing with the
short-run problems alone. The short-run gains of reducing
adjustment costs tend to be one time and relatively small,
while the gains from improved long-run allocation of
resources are recurrent, and hence, potentially much larger.
Furthermore, whatever the type of program, the economic costs
of the resources involved in mounting this program have to be
counted against the gross benefits to determine the net
benefit.

How would "manpower" policies be classified? By
manpower policies we mean those directed at improving the
occupational and geographic mobility of workers by providing
occupational counselling, job vacancy information, retraining
assistance and transportation assistance both in job-search
and for moving to take up a job in a new region. Such
programs generally aim at reducing the friction in job-search
by improving the technique and/or reducing the fixed costs of
search and by reducing the labour turnover by improving the
matches between worker capabilities and job requirements. If
applied generally to the labour market, such programs can be
expected to reduce frictional unemployment which would lead
to lower unemployment rates, less unemployment insurance
payments, and increased tax revenues from the incremental
employment. Such manpower programs only lead to short-run
gains if they are aimed at a limited group of workers who are
not necessarily the long-run marginal suppliers of labour to
a region or occupation. The long-run allocation of labour
remains unaffected unless the marginal supply and demand
decisions are affected. In general, the long-run labour
market structure depends upon the entire spectrum of
government programs that change the relative attractiveness
of employment versus unemployment, more stable versus less

stable jobs, employment in one region or occupation versus another, and so on. The entire range of government interventions from tax expenditures to income-maintainance programs have major effects on the incentive structure facing workers, and hence, the long-run structure of employment and unemployment. A universal program such as the unemployment insurance scheme, for example, can be expected to effect the choice of region, stability of jobs and duration of unemployment. Both the pace and extent of adjustment is affected for the labour market as a whole.

2. REGIONAL DISPARITIES AND THE ROLE OF MIGRATION.

The disparities in the growth rates of regional labour markets in Canada are illustrated in Table 2.1 which gives the annual growth rates in the annual average of the monthly levels of the numbers in the labour force, employed and unemployed, and the annual growth rate of the unemployment rate in each province over the period 1970 through 1979. The striking features of these results are first, the rapid growth in employment in Alberta (a 4.93 percent annual growth rate implies a doubling of employment in about 14 years) accompanied by very low growth rates in the numbers experiencing unemployment, leading to a declining unemployment rate; second, the low growth rates in employment; and third, the rapid growth in the numbers of unemployed and the unemployment rates in the Atlantic Provinces, despite approximately average growth rates in employment. This last phenomenon is also observed to a lesser extent in Ontario and Quebec. The differential growth in unemployment underlines the exacerbation of regional disparities in Canada as measured by unemployment rates.

Table 2.1   Annual Growth Rates in the Provincial
                                   Annual Average Numbers in the Labour Force,
                                   Employed and Unemployed and the
                                   Unemployment Rates from 1970 through 1979.

(Percentages)

Province	Labour Force	Employment	Unemployment	Unemployment Rate
Newfoundland	4.52	3.45	13.80	9.28
Prince Edward Island	4.07	3.33	a	a
Nova Scotia	2.95	2.37	11.06	8.11
New Brunswick	3.52	2.93	10.14	6.62
Quebec	2.59	2.26	6.29	3.70
Ontario	3.39	3.13	8.09	4.70
Manitoba	2.23	2.24	2.40	.17
Saskatchewan	2.49	2.48	2.05	- .44
Alberta	4.78	4.93	1.54	-3.24
British Columbia	3.84	3.84	3.83	- .01
Canada	3.26	3.04	6.49	3.23

Calculated from Statistics Canada, Catalogue 71-201 (Annual).

a. Not reported as relatively high error in small sample

The data in Table 2.1 can be expanded upon to show the
potential importance of migration (both international and
interprovincial) as a labour market adjustment mechanism in
terms of its effects on changes in the unemployment rate of a
province. Now it can be shown that the growth rate in the
unemployment rate (g_{UR}) can be expressed either as the
difference between the growth rate in the numbers unemployed

(g_U) and the growth rate in the numbers in the labour force (g_{LF}), or as the difference in g_{LF} and the growth rate in the numbers employed (g_E) multiplied by the employment rate (1-UR) divided by the unemployment rate, (UR), i.e.,

$$g_{UR} = g_U - g_{LF}$$

$$= \frac{1-UR}{UR}(g_{LF} - g_E)$$

Hence, for a given growth in employment over some period, the unemployment rate grows if the labour force grows faster than employment and declines if it grows slower than employment. If the growth in employment (g_E) is taken as given, then g_{UR} depends upon g_{LF}. Now the labour force expands as a result of the growth rates in the labour force participation rate (g_R) and in the working age population (g_{pop}). This population grows due to natural increases (g_N), net international migration (g_M), and net interprovincial migration (g_{Mi}), i.e.,

$$g_{LF} = g_R + g_{pop}$$

$$= g_R + g_N + g_M + g_{Mi}$$

The 1970s evidenced rapid growth in the Canadian labour force. Refer to Table 2.2. This was largely due to the rapid natural increase in the working age population as the "baby-boom" wave passed through. The second most important source of labour force expansion was the growth in participation rates, especially those of women. The remaining changes in the provincial labour forces depended upon the net adult interprovincial and international

migration rates. Even though net migration is the smallest
source of change in the labour forces in all provinces
(except Alberta and British Columbia where migration resulted
in larger increases than participation rate changes), it is
by far the most flexible and sensitive component of the
growth of the labour force in a region. Small changes in
regional net migration rates can have large impacts on the
changes in the unemployment rate in a region over the medium
run.

To illustrate the importance of net migration as an
adjustment mechanism, consider the net migration rates that
would have been required to keep the unemployment rate in
each province at its 1970 level.[8] Refer to Table 2.3. If
the regional rates of growth of employment[9], participation
rates[10], and the adult population due to natural
increases are constant and independent of changes in the
migration rates, then migration remains the determinant of
the changes in the regional unemployment rate. As was noted
earlier in this section, unemployment rates grew rapidly in
the Atlantic Provinces, grew slowly in Central Canada, and
remained steady or declined in the Western Provinces over the
1970s. This implies that in the Atlantic Provinces, and to a
lesser extent in Quebec and Ontario, the labour force grew
faster than employment. In all provinces except Newfoundland
and Quebec, this excess labour force growth was reinforced by
net immigration. In the Atlantic Provinces this net
immigration was mainly due to net interprovincial
in-migration, while in Ontario net international migration
was more important. By contrast, in the West in Manitoba and
Saskatchewan, net interprovincial out-migration was high
enough to reduce labour force growth down to the employment
growth rates, while in British Columbia and Alberta rapid net
in-migration served to expand labour forces almost at the
same pace as employment.

TABLE 2.2   ANNUAL GROWTH RATES IN THE PROVINCIAL LABOUR FORCES AND THEIR COMPONENTS OVER THE PERIOD 1970-79

(PERCENTAGES)

Province	Labour Force	Participation Rate	Working Age Population b	Net Migration c			Natural Increase d
				Inter-Provincial	Inter-National	Total	
Newfoundland	4.52	2.18	2.34	- .25	- .04	- .29	2.63
Prince Edward Island	4.07	1.57	2.50	+ .55	+ .06	+ .61	1.89
Nova Scotia	2.95	.94	2.01	+ .16	+ .08	+ .24	1.77
New Brunswick	3.52	1.14	2.38	+ .42	+ .08	+ .50	1.88
Quebec	2.59	.91	1.68	- .42	+ .10	- .32	2.00
Ontario	3.39	1.07	2.32	+ .02	+ .54	+ .56	1.76
Manitoba	2.23	.98	1.25	- .61	+ .38	- .23	1.48
Saskatchewan	2.49	1.39	1.10	- .72	+ .02	- .70	1.80
Alberta	4.78	.97	3.81	+ .98	+ .44	+1.42	2.39
British Columbia	3.84	.74	3.10	+ .68	+ .43	+1.11	1.99
Canada	3.26	1.02	2.24	--	+ .32	+ .32	1.92

a. Calculated from Statistics Canada, Catalogue 71-201 (Annual).

b. $g_{pop} = g_{LF} - g_R$

c. Annual average net adult migration over 1970-79 divided by mid-period adult population,
    Calculated from Statistics Canada, Catalogue 91-208 (Annual) and Catalogue 91-518 (Occasional).

d. $g_N = g_{pop} - g_M - g_{Ml}$

When the actual net migration rates are compared to those that would have been required over the 1970s to keep unemployment rates steady, the Western Provinces were close to being in equilibrium. In the Atlantic and Central Provinces, however, faster net out-migration or slower net in-migration would have been required. Newfoundland would have required rapid net out-migration. P.E.I., Nova Scotia and New Brunswick would have had to have switched from in-to modest out-migration rates. Quebec required more rapid out-migration and Ontario slower in-migration.

A number of points can be made about the estimated required net migration rates. First, none of their magnitudes are out of line with observed net migration rates. Second, the total volume of gross migration is typically in excess of five times the net migration rates. This implies that the potential for these changes in the migration patterns exists among those who already move. Third, switches from net in- to net out-migration (or vice-versa) can and do occur quite rapidly. This can result from the combined and reinforcing effects of declining in-migration and rising out-migration.

Governments play a non-neutral role in affecting the pattern of migration flows. Given the suggested importance and sensitivity of these flows, government actions affecting them must be given careful consideration. Government programs can affect both the relative attractiveness of being employed and unemployed in different regions. The more generous unemployment benefits in regions with higher unemployment rates can dampen out-migration incentives.[11] Another example is that the creation of new jobs that provide temporary or discontinous employment can be expected to have a certain amount of unemployment associated with them and to promote net immigration in excess of the employment created.[12]

TABLE 2.3. ANNUAL GROWTH RATES IN PROVINCIAL UNEMPLOYMENT RATES AND TOTAL
NET MIGRATION RATES OVER THE PERIOD 1970-79
(Percentages)

Province	Unemployment Rate	Excess Labour Force	Net Migration Actual Total Net Migration	Net Migration Required Total Net Migration
Newfoundland	+ 9.28	+ 1.07	- .29	- 1.36
Prince Edward Island	-	+ .74	+ .61	- .13
Nova Scotia	+ 8.11	+ .58	+ .24	- .34
New Brunswick	+ 6.62	+ .59	+ .50	- .09
Quebec	+ 3.70	+ .33	- .32	- .65
Ontario	+ 4.70	+ .26	+ .56	+ .30
Manitobia	+ .17	+ .01	- .26	- .22
Saskatchewan	- .44	+ .01	- .70	- .71
Alberta	- 3.24	+ .15	+ 1.42	+ 1.57
British Columbia	- .01	0	+ 1.11	+ 1.11
Canada	3.23	+ .22	+ .32	+ .10

a. $g_u - g_{LF}$, see Table 1

b. $g_{LF} - g_E$, see Table 1

c. $g_M + g_{Mi}$, net international plus net interprovincial migration.
    See Table 2.2

d. $(g_M + g_{Mi}) - (g_{LF} - g_E)$

3. THE UPSIDE LABOUR ADJUSTMENT PROBLEM

Unexpected rapid growth in the demand for labour by a
sector or region can lead to short-run problems if the local
labour supply is inadequate to meet the demand in terms of
aggregate labour supply and/or the mix of skills required.
Alberta can be characterized as suffering both aggregate
labour supply (see Table 2.1) and specific skill shortages.
Problems in filling job vacancies in certain skill
categories, however, are endemic to all regions of
Canada.[13] In response to such shortages, the labour
market is expected to undertake its normal range of
corrective actions. Wages would be bid up which would both
dampen demand and expand supply. In particular, increased
interregional wage differentials would be expected to induce
increased net in-migration into the high-labour-demand
regions. Firms would also be expected to undertake actions
to increase their supply of labour: direct hiring from
outside the region or bidding workers away from other firms
in the region, or alternatively providing training assistance
to meet certain skill shortages.

What gross economic gains could be generated from
government interventions that increase the pace of labour
market adjustments to unexpected excess demand? In general,
such gains potentially arise from the earlier capturing of
any surplus by consumers or factors as the wage falls after
being bid up by the shortage, and from the economy capturing
any externalities from the more rapid expansion of activity.
The economic costs of government intervention are counted
against these gains in determining the net economic benefits.
In Appendix A the specific case of an unexpected skill
shortage is discussed in terms of a simple but formal model.
It is useful to review here factors that would increase the
size of the gross economic gain from government adjustment

policies as well as general principles for designing these policies that are derived from analysing this model.

The potential maximum gross labour market gains from a government intervention to reduce an unexpected skill shortage increase with:

(i) the size of the shortage (or the increase in the number of unfilled vacancies that would exist at the previous equilibrium net-of-tax wage rate);

(ii) the increase in the market wage rate due to the shortage;

(iii) the size of the positive labour market externality associated with increased employment of skilled workers;

(iv) the length of time required to train an additional skilled worker, T; and

(v) whether the shortage is expected to last longer than the unit training time, T.

Given these dimensions of the maximum potential gross gain, the net economic benefits depend upon the economic cost effectiveness of any policy in terms of decreasing the time for which the shortage lasts, or in other words bringing forward in time the date from which the economic surplus and labour externality benefits of expanded use of skilled labour are captured.

The government has two general strategies it can follow aside from regulating the flow of skilled international immigrants: (i) active participation or (ii) altering the

structure of private supply incentives. The first approach
implies that government sets up an agency that actively
collects labour market information, predicts likely shortage
areas and encourages labour supply to increase by
disseminating this market information, or directing subsidies
to firms or institutions to increase their supply of trained
workers. To eliminate an unexpected shortage completely
(i.e., a 100 percent effective intervention) requires that
government outperform the market place by predicting that the
normal operations of the labour market will result in a
labour shortage of some specific skill (or in some area) at
least T years ahead of time. This implies that the
government either has better information at its disposal or
can interpret market information better than the cumulative
performance of the private market. The comparative advantage
of the government would be expected to be at the level of
broad occupational categories and where lengthier training is
involved as in the professions, rather than at the level of
the detailed specifics of job requirement, particularly where
the legnth of training is short and the specific skill
requirement is continually changing. Where training takes
place almost entirely in government funded or regulated
institutions, however, the government obviously has its hand
on the supply control valves and is obliged to pay close
attention to future market demands. Clearly where government
budgetary or regulatory practice is resulting in the
misallocating of educational and training resources away from
high demand but towards low demand skills, skill shortages
can arise and persist not necessarily because of any failure
by the private sector to predict demand trends, but because
of supply constraints stemming from government actions.

It is important to note that although longer lengths of
training, T, imply greater potential gains from improving
skill supply adjustment speeds; the higher T, the earlier the
predicted shortage has to occur in order to have increased
numbers of trained workers available.[14] Hence, where T
is large, the effectiveness of any government program can be
expected to be low. A further important consideration for
the success of this approach is whether or not the shortage
is expected to persist longer than T. The shortage is likley
to be short-lived if the demand increase is due to a one-time
shock (e.g., some major project) as long as the long-run
supply is responsive. However, if the shortage is the result
of persistent excess demand lasting a number of years then an
activist government role in promoting labour adjustment can
be beneficial even with a poor prediction performance as
adjustment gains can still be captured after the onset of the
shortage.

The second approach is to attempt to improve the
performance of training institutions in predicting labour
market demand trends and in adapting their training curricula
to the perceived trends. The aim here is to leave the burden
of prediction in the market place, encourage activities that
would improve it, and increase the flexibility and
responsiveness of training institutions to market demands.
One method of implementing such an approach is to tie the
level of public funding to the placement record of graduates.
The institution then has an incentive to align its training
emphasis, particularly where highly job-specific skills are
required, to existing and expected vacancies without any
direction being given by government agencies either in the
form of regulations, information, or differential subsidies.
Firms that undertake on-the-job training obviously adapt
their training continuously to their perceived current and
future skill requirements. This second approach aims to
promote and improve the operations of the market place,

whereas the first approach is substituting a government
agency for some market operations.

These two approaches are not necessarily exclusive
alternatives. The first is more likely to succeed at a
general education development level and to give overall
direction to totally publicly funded higher education.
Although, even where long term institutional training is
required, as in the professions, awarding funding in ways
that make institutions more responsive to labour market
demands can be beneficial. The encouragement of funding of
institutional training and research by private industries
would tend to give some market direction. The second
approach seems particularly well suited for the detailed and
ever-changing information required for directing shorter
job-specific technical training.

While unexpected growth in demand can result in specific
skill shortages and the loss of any net economic benefits
associated with the job vacancies, the rapid growth of a
region can lead to general labour shortages in the region.
Where disparities exist in regional growth rates as they do
in Canada (see Section 2), the probability of short-run
imbalances in labour markets increases. Government programs
can be seen to both hinder and help the inter-regional
adjustment of labour supplies. Aside from the mobility and
job-search grant programs and the tax deductibility of moving
expenses, most government programs are aimed at either
hindering or substituting for inter-regional migration. The
unemployment insurance scheme falls in the former category.
Extending the benefits available to workers in high-
unemployment-rate regions removes some of the incentive for
workers to move to high-labour-demand regions. Numerous
programs substitute for labour mobility by promoting job
creation in the slow-growth regions: regionally

differentiated tax credits for investment, DREE financial
assistance programs, direct employment programs, and the use
of temporary and permanent international migration as a
gap-filling source of labour fall into the category of
substitutes.

4.   THE DOWNSIDE LABOUR ADJUSTMENT PROBLEM

There are many reasons for decreasing labour demand in
specific sectors, leading to workers being laid-off: changes
in consumer tastes or in the prices of competing products,
technological improvements and increasing labour
productivity, an over-valued foreign exchange rate leading to
a loss of international competitiveness, or reduced trade
protection. In this section the last source of labour
adjustment is expanded on as an example of the downside
problem due to labour demand contraction.

As mentioned in the introduction, a number of
labour-intensive, import-competing sectors -- clothing,
knitting, textiles, assembled electrical products, and
footwear -- experienced difficulty during the 1970s in
competing with imports and have required above average levels
of government assistance to maintain employment levels.
Given the concentration of these sectors in Central Canada,
which has been experiencing at best average growth rates in
employment, the size of adjustment costs that are anticipated
for the economy and the workers if the levels of assistance
-- particularly trade protection -- are reduced, are commonly
viewed as high. The realignment of employment under more
liberalized trade is a major adjustment problem facing
Canada. The automobile sector has in recent years become a
further sector with trade adjustment problems. Currently,
most of the adjustment burden has been borne by consumers

having to pay relatively higher prices for protected commodities.

The adjustment problems of dislocated workers can be viewed from two major perspectives. First, from the private perspective there are the potential income losses of the laid-off workers as well as others whose incomes are indirectly affected by the layoff. This raises issues of fairness and political expediency. Should the losers be compensated? As discussed in the introduction, this is essentially a question of political judgment although in situations such as trade liberalization the extent of the liberalization, and hence, the labour adjustment can be linked to these private losses. Effective political lobbying stimulated by these adjustment costs can reduce or block any government actions that would require adjustment. Both the costs and the benefits of adjustment are then foregone.

The second perspective is that of the economy as a whole. Here the concern centres on the economic costs of labour adjustment and policies to reduce these. One approach is to reduce these costs by extending the lives of the jobs in jeopardy by subsidizing the operations of the firm. An alternative approach is to design policies to promote the re-employment of the laid-off workers.

Private Income Losses and Compensation Payments

When workers are permanently laid off for whatever reason, some retire and the rest are usually unemployed for a spell before finding subsequent employment. Their next job may be less permanent, may offer less favourable working conditions, and may pay less than their previous employment. There may also be loss of pension and other fringe benefits.[17] If their subsequent employment is temporary, then there will

be another spell of unemployment, another job and so on such that the probability of their being at work following layoff may be less than before layoff. The reduced proportion of time spent employed plus any reduction in wage rates combine to create expected income losses for displaced workers. The losses arising from layoffs are offset by unemployment insurance benefits and, in some cases supplemental unemployment benefits while unemployed, and in many instances of permanent layoffs, severance payments are made.[18,19] These income losses constitute part of the private costs of being laid off, and their magnitude is specific to the workers directly affected.

Expected income losses due to changes in the values of employed and unemployed time can be estimated as follows. Before being permanently laid off, workers receive their net-of-income-tax earnings when employed, and if they are unemployed for part of the year they receive their net-of-income-tax unemployment insurance payments plus the value of the time spent on non-market activites. This combination of net-of-tax earnings from employment, unemployment insurance benefits, and value of non-employed time is referred to as the workers' full private income before layoff. Because the proportion of time spent employed and unemployed and the wage rate earned are altered after layoff, the expected full income also changes. The difference between the two full income streams before and after layoff measures the expected income loss over time.

The factors affecting the change in wage rates and in the proportion of time at work, relate to the characteristics of the job lost, to the characteristics of the workers, the region, and the economic conditions at the time of layoff. The permanent workers in these firms are often in quasi-fixed supply. That is to say, they have become specialized in their jobs through lengthy and specific on-the-job training,

and their productivity and wage rates are often higher in
their current employment than in alternative employment.
Moreover, because they are often older, their geographical
and occupational mobility is more limited. The costs of
adjustment for such displaced workers are likely to be
positively related to their age. Other socioeconomic
characteristics like sex, marital status, the number of
dependents, and skill level also influence the speed and
extent of adjustment and should be taken into account when
estimating expected income losses.

The private adjustment costs are also closely related to
economic conditions in the region and the economy at large.
If the unemployment rate is initially low and the demand for
labour is growing rapidly, displaced workers can expect to
experience a shorter duration of unemployment, a longer
duration of subsequent employment, and a smaller income
loss.

The displacement of workers in large, heterogeneous
labour markets generally results in shorter periods of
unemployment and a smaller change in earnings. Proximity to
an urban centre or a growing population in a region also
ensures a greater demand for housing so that the prices of
homes do not decline as much if a firm is forced to shut down
and to lay off its workers. Hence, workers in larger urban
areas are less likely to face a capital loss on the sale of
their homes if they have to move to find another job.

The private adjustment costs are usually larger in
regions that are relatively more isolated from other large
labour markets and that lack diversity in the type of skills
demanded. If a major firm in the community shuts down, the
number of alternative job opportunities is more limited, and
workers may have to migrate to find employment. They then
also incur the costs of moving. These factors, combined with

family relations and social ties to the community, discourage
migration to other labour markets and raise the costs of
adjustment for both workers and the economy. The case of the
small, isolated community experiencing a major contraction is
the exception rather than the rule. It applies to the
isolated mining community for example.[20] Most of the
Canadian labour force is located in or near other labour
markets.[21]

Not every displaced worker need be worse off. Some
workers who have been employed in declining firms might find
more lucrative employment in expanding sectors elsewhere. It
remains an empirical problem to determine the magnitude of
the expected income loss. Even in more isolated communities
not everyone need be worse off as a result of the decline in
the demand for housing services. Individuals who rent their
accommodations are better off if rental prices fall or do not
rise as quickly; their landlords, however, suffer a capital
loss. The timing of capital losses also varies from one
homeowner to another. Those who decide to move out of the
community soon after a firm shuts down must bear an immediate
capital loss, if they sell their homes at that point rather
than rent until the market in the region recovers. The job
prospects of the migrant must be sufficiently good to offset
the relatively more expensive housing costs which they would
encounter elsewhere. Clearly, compensation for the loss of
housing values can be expected to increase the number of
voluntary out-migrants from the region. Older workers who
lack marketable skills are more likely to remain in the
community. They do not bear an immediate capital loss;
nevertheless, at a future date they, or their heirs, will be
worse off by the decrease in the value of their estates.

Other workers in a region may be indirectly affected by
the layoff of workers from a base sector industry. Workers

in the secondary sector employment (i.e., employment
sensitive to the level of local expenditures) may lose their
jobs and incur adjustment costs. Such secondary sector
adjustment costs would only be important in slow-growing
regions where the loss of base sector jobs was relatively
large. If employment in a region is on a rapid growth path
or the layoff is relatively small, then total employment
would recover rapidly and few secondary sector layoffs would
be expected. Even where the growth rate is slow and the loss
of jobs relatively large, the resulting decline in real
estate values and ready availability of vacant factory sites
and unemployed labour would make the region an attractive
location for new ventures which could boost the employment
growth and, hence, cause more rapid recovery than would be
indicated by a trend growth rate.[22]

Whether or not to pay compensation for the loss of real
estate values due to plant closure requires consideration of
a number of points. First, the magnitude of the loss is
important. It is expected to be relatively low except in the
isolated one-company town. Even in such instances, it is
common for the company to own the homes and rent them to its
workers, thereby absorbing the obvious risk of a capital loss
if the firm fails. Second, if the population and income per
capita in the region are growing, then the loss of jobs may
only delay new housing starts and, hence, have only a minimal
impact on the value of the existing housing stock. Third, in
situations where a layoff would effect housing prices,
expectations of this would be built into the value of housing
sales some time ahead of the layoff. Thus, not all current
owners would experience a loss. Fourth, the real estate
losses would be experienced by all owners of property in the
region. If the laid-off workers tended to be renters rather
than owners, the directly affected workers might suffer lower
property losses than indirectly affected persons. Property

owners in a region need not necessarily be resident in the
region. This leads to a fifth point concerning the extent
and purpose of compensation. If compensation for a
government-induced plant closure is to be paid to all net
losers, then the coverage of a program becomes extensive and
complex. If, however, compensation is seen as a means to an
end (for example, as a means to allow less trade protection)
then the extent and coverage of compensation can be limited
by political expediency. Note that workers and capital
owners are regularly suffering losses (or experiencing
windfall gains) either due to changing government policies or
due to private-sector-induced market shifts. Such losses are
not compensated and are commonly regarded as part of the
normal risk of economic activity. Any compensation program
has to represent a compromise between the magnitude of the
losses and any hardships that result; the political necessity
of the compensation and the overall economic net benefits
that can be gained from the government action that leads to
some persons losing income. In the case of trade protection
for weak industries, if this protection is being provided due
to political concerns arising from the costs of
liberalization falling heavily on workers who are regionally
concentrated and perceived to have poor re-employment
prospects, then focusing a compensation program, as part of
an adjustment assistance package, on the workers who are
expected to be directly affected by trade liberalization
seems appropriate.

Evidence is beginning to accumulate that while laid-off
workers do experience income loss from changes in the values
of their employed and unemployed time, their re-employment
experience is reasonably good. The magnitudes of income
losses appear to indicate that a program of severance-pay-
type compensation payments is feasible. For example, results
of the re-employment experience of 4250 workers who lost

their jobs from the clothing, textile, knitting, and
electrical product sectors mainly in Quebec and Ontario
during the period 1974 through 1976, show mean durations of
unemployment (including time spent out of the labour force by
discouraged workers) of 12.5 months and median durations of
7.3 months. Subsequent employment spells lasted 16.1 months
on average resulting in workers being employed 55.5 percent
of the time on average.[23]

These average results for the overall sample, however,
do not standardize for the composition of the sample in terms
of the personal charateristics of the workers in the sample.
When these are taken into account widely varying experiences
are found. For example, prime age males experienced mean
durations of unemployment of 5.4 months and median durations
of 1.0 month and the expected proportion of time spent at
work rose from 55.5 percent to 75.6 percent. Older males
displayed considerably fewer unemployed spells, averaging 12
to 13 months in length. These long unemployment spells were
offset by subsequent greater job stability that kept the
proportion of time working above 60 percent. Females,
particularly those with working spouses, also take lengthy
periods to regain employment. Again, relatively high job
stability raised the proportions of time working for most
females to above 40 percent. Low education and skill levels
both increased the difficulty of workers finding and keeping
jobs, and poor overall labour demand conditions in the
economy increased the durations of unemployment. Regional
influences also appeared to be important. In both Quebec and
Ontario workers displayed fairly similar re-employment
experiences, but significant differences appeared between
the two provinces. Quebec workers generally had more
difficulty in finding and keeping employment than Ontario
workers.

Although the problems with becoming re-employed just mentioned affect the income losses of laid-off workers, the loss of income is more sensitive to the ability to regain wage levels. If there are no changes in wages in constant dollar terms, then income losses over a five-year period, in present value terms, total between $1,000 and $4,000 (in 1978 dollars) or a loss of some 3 to 10 percent. Under some circumstances workers actually experience wage increases in their new jobs. This can occur if the firm from which they were laid off has been struggling for some time to remain profitable during a period of rising real wage rates, and, hence, has probably raised wages over time at a below average rate. Furthermore, the trade-protected, labour-intensive industries tend to pay below average wages and the majority of laid-off workers changed industrial sectors and occupations between jobs.[24, 25] Those who experienced wage increases tended to suffer losses below $2,000. For those whose wages declined, however, losses of up to $10,000 have been estimated. Two types of workers appear to suffer the worst declines in wage rates: women and the more highly skilled workers who lose firm-specific rents.[26]

Estimates of income losses based on changes in the values of employed and unemployed time following job loss have also been made for the average unemployment insurance claimant in five Ontario and four Quebec regions that have experienced major layoffs in the trade-protected sectors during the mid-1970s. Regional data bases were set up from unemployment insurance claim, record of employment and administrative data that described the employment/ unemployment experience of any worker who established a claim in any one of these nine regions from 1972 through 1976. In general, these ROE-UIC results supported those based on the

labour force tracking data mentioned above. The only
difference between the results tended to be that the workers
on the ROE-UIC data base displayed greater employment
instability both before and after a layoff. This also
implied that these workers were less likely to have
firm-specific skills that would lead to a loss of rents from
layoffs.[27]

A number of points about income losses and compensation
programs should be noted. First, the magnitude of the losses
is relatively small, and hence, makes severance-pay-type,
lump sum (or the equivalent in installments) compensation
payments to a designated group of workers whose jobs are at
risk a financially feasible prospect. Second, more complex
programs can be designed to limit the program expenditures,
other than by limiting the designated potential
beneficiaries. The tax-back provisions that are inevitably
part of such programs, however, can result in work
disincentives that merely produce slower re-employment and,
hence, efficiency losses for the economy as a whole. Third,
layoffs increase the uncertainty of a worker's future income
stream and, hence, impose an added cost of risk on the risk-
averse worker.[29] A risk premium can justifiably be
included in a compensation payment, or alternatively some
contigency claims scheme of compensation can be used. Given
the lack of independent and objective states by which to vary
the compensation payments to laid-off workers, however, this
latter insurance approach, if based on post-layoff
re-employment experience, leads to the work disincentive of a
guaranteed income and the same efficiency losses already
mentioned. Fourth, compensation payments can be made to
offset the expenditure decline in a region that follows a
plant closure, thus reducing any loss of jobs sensitive to
regional expenditure levels. Fifth, although attempts can be
made to differentiate among workers in terms of expected

income losses on the basis of worker or regional
characteristics, a number of arguments can be presented for
one fairly generous lump sum payment: simplicity of program
design and delivery; progressivity, in that it implies
relatively higher compensation to lower paid workers; and
the precision in prediction of re-employment experiences and
income losses is relatively low. If any differentiation is
to be made among workers some age-sex and perhaps skill
categories could be recognized. From the perspective of
political effectiveness of the program it is important that
the majority of workers are adequately compensated:
over-compensation is preferable to under-compensation as long
as the program is efficiency neutral. If the compensation
program is combined with any re-employment assistance
provisions, then the amount of compensation can be reduced
and more direct attempts can be made to eliminate that small
minority of workers who suffer excessive re-employment
difficulties.

Economic Losses and Re-employment Promotion Programs

When a firm is forced to close due to changing market
circumstances, gross negative externalities or economic costs
can result in the labour market. The economic cost of
permanently laying off workers is equal to the difference
between the expected economic value of labour in the economy
with and without the layoff. The economic value of employed
time can be approximated by the gross-of-tax wage rate which
in turn should be roughly equal to the marginal productivity
of labour. The economic value of unemployed time is the
value of time spent on non-market activities. While
unemployment insurance payments are included in the private
income of workers, these payments are considered transfers
from the point of view of all persons in the economy and,
hence, are not included in the economic value of unemployed

time. By the same token, personal income taxes are excluded from the private income of workers but are included in the economic value of employed time. The consistent treatment of taxes and transfers is crucial to the distinction between private and economic costs.

Two models have been used for the estimation of the economic costs of displacing workers and of the corresponding economic benefits from delaying that displacement.[28] One is a partial equilibrium model which focuses on the change in the economic value of time of only the workers directly affected by a layoff. When workers are permanently laid off some will retire, others may find employment straight away, but most will experience some unemployment. It is possible to estimate the probability that displaced workers will be at work at any point in time following layoff. The changes in their employed and unemployed time can then be multiplied by their respective economic values to estimate the change over time in the economic value of the workers' time. In most cases, the lower probability of being at work and the decrease in wage rates after layoff will combine to reduce the economic value of labour below its value before layoff, and thus to create a negative labour externality which is the economic cost of worker adjustment.

The central weakness with the partial equilibrium model is its implicit assumption that there are no other externalities created in the rest of the labour market when these workers are laid off. This will occur only if the displaced workers do not affect the job prospects of other workers. Although such situations could arise, it is more likely that laid-off workers would compete with other members of the labour force and would thus increase their duration of unemployment as well. Even if all the displaced workers were to find alternative employment immediately, therefore, the

private costs of adjustment would be borne by others and the economic costs of adjustment would still exist.

To capture the overall response of the regional labour market to a disturbance like worker layoffs and to estimate the associated negative labour externality, a general equilibrium model has been used. This model simulates the changes in unemployment, net out-migration, labour force participation, the ability of other employers to fill existing vacancies, and secondary employment in the region compared with what would have happened without the disturbance. The economic value of the time of those workers who are finally induced to adjust their supply of labour to the region, thereby bringing the labour market back to equilibrium, determines the negative labour externality created by the layoffs and the economic cost of adjustment.

Although any decrease in housing prices as a result of shutting down a firm in a more isolated part of the country may create a financial loss for homeowners, it does not create an economic resource loss. Because the stock of housing is fixed in the short run, there is no release of resources into the economy. The only economic cost from a regional perspective would be the forgone labour externality which might have been generated in new housing construction. This forgone externality would be captured by the induced change in secondary employment in the general equilibrium model.

Given the potential economic losses in the labour market from layoffs, it is appropriate to consider government interventions that could reduce these costs. The basic strategy is to attempt to raise the economic value of labour in alternative activites. Two categories of alternatives can be identified. The first is to maintain the jobs or delay

the layoff by offering assistance to the firm. The second is
to improve the re-employment prospects of the laid-off
workers, by enhancing the speed of re-employment and/or the
stability and quality of subsequent employment.

It is important to understand both the nature of the
government decision to assist a firm affected by changes in
trade or industrial development policy and how such a program
could be integrated with other re-employment-promoting
programs as well as compensation programs to form a
consistent and mutually reinforcing package. Refer to Figure
4.1. When the workers, management, or owners of a firm
approach the government for assistance in order to avoid a
major permanent layoff (Step A), the government should be
concerned about two major questions: (i) whether the
incremental employment of resources (labour, capital, and
material inputs) achieved by the continued operation of the
firm (with or without any re-tooling or new investments) is
expected to be economically beneficial to the country (Step
B), and (ii) whether the proposed business activity is an
attractive investment from a private-sector perspective (Step
C). Step (B) requires an economic efficiency analysis,
whereas step (C) involves a financial analysis from the point
of view of the private investors. The government should be
interested in achieving incremental economic benefits (Step
D). Such incrementality depends upon avoiding the
subsidization of firms whose continued profitability is not
jeopardized by changing market circumstances brought about by
trade liberalization but rather by some other cause like poor
financial or business management. The government also has to
guard against the firm seeking windfall gains from the
program by threatening the government with an imminent but
unintended major layoff unless financial assistance is
forthcoming. If a firm closes down through bad management in
an otherwise privately profitable industrial sector, then

Figure 4.1 Government Decisions and Program Responses to Adjustment Situations

A ┌───┐
  │ Workers and/or management approach the   │
  │ government when faced by imminent   │
  │ closure or major permanent layoff   │
  └───┘

B ┌───┐
  │ Is continued operation of   │
  │ firm economically attractive?   │
  │ (Economic efficiency analysis)   │
  └───┘

         YES   NO

C ┌──────────────────┐   F ┌──────────────────┐
  │ Is business an   │   │ Firm allowed   │
  │ attractive private│   │ to contract   │
  │ investment?   │   │ or close: │
  │ (Private investment│   │ workers laid off │
  │ analysis)   │   └──────────────────┘
  └──────────────────┘

         YES   NO

D ┌──────────────────┐   E ┌──────────────────┐   G ┌──────────────────┐
  │ No assistance   │   │ Adjustment assistance│   │ Compensation   │
  │ given an non-   │   │ benefits offered to │   │ and/or re-   │
  │ incremental   │   │ firm   │   │ employment   │
  │ business activity│   └──────────────────┘   │ assistance pro- │
  └──────────────────┘   │ gram benefits   │
                                                  │ made available   │
                                                  │ to workers   │
                                                  └──────────────────┘

more technically efficient domestic producers can be expected to expand their output to supply the market. In such circumstances, the government may try and find a buyer for the struggling firm among the successful businesses in the sector. This would prevent its existing labour force from suffering dislocation. Business mergers can also be encouraged, provided they do not violate anti-combines legislation. If such approaches prove unsuccessful, then the workers laid off in such circumstances should not be precluded from any worker adjustment assistance (Steps F and G).

If the government evaluation of the firm concludes that its continued operation would expand output and employment and that this would be economically beneficial, then an appropriate level of financial assistance could be offered (Step E). All possible economic externalities should ideally be included in such an evaluation. If, however, the focus is only on the added labour employment created, then a reasonable rule is to award assistance equal to the net labour externality. It is worthwhile to distinguish here between gross and net labour externalities. The gross labour externality is defined as the change in the economic value of workers' time, as a result of a disturbance like a layoff, without regard for the level of trade protection or other distortions in product markets where the workers' output is sold. The net labour externality takes into account distortions in the product market and, hence, is lower the higher is the level of trade protection, and any government financial assistance intended to promote economic efficiency should be reduced accordingly.

If continued operation of the firm is not expected to be economically attractive to the country, then allowing the firm to close is the preferable path (Step F). In such a

situation, or if no adjustment assistance program for firms exists, laid-off workers would still be eligible for compensation and/or benefits available from a re-employment promotion program (Step G). The latter type of program helps to improve the income and re-employment prospects of workers and thus helps to alleviate any political pressure the government might face when it decides not to offer assistance to a declining firm on general economic grounds but where the workers, nevertheless, face potential hardships.

Fairly extensive consideration has already been given to income loss compensation programs for laid-off workers. Some discussion of adjustment assistance programs directed either at the firm or at the laid-off workers to promote re-employment is now appropriate.

Adjustment Assistance Programs for Specific Firms

Improvements in economic efficiency can be gained through delaying or preventing layoffs. The most likely source of economic benefits is related to the positive labour externalities generated by the incremental employment created through keeping a firm in business. Government assistance programs to such firms can take many forms: direct grants or forgiveable loans based on the jobs maintained would be two examples. A firm could either continue operations in the same sector or re-tool to convert to some more attractive product line and, hence, maintain (or perhaps even expand) its employment level.

To illustrate the magnitudes of the gross labour externalities, some examples are drawn from estimates for workers laid off in the Sherbrooke region of Quebec.[30] Based on the partial equilibrium model, the present values of gross labour externalities from delaying layoffs indefinitely

for a sample of workers in the textile, knitting, and
clothing industries who had for the most part experienced
permanent employment prior to layoff were estimated to be in
the range of $6,000 to $14,000 per worker (1978 dollars).
For the average worker in the region who had experienced
temporary or discontinuous employment prior to job loss
delayed layoffs were estimated to generate gross benefits in
the range of $4,000 to $9,000 per worker. Where wage
increases were experienced in new jobs, the gross labour
externalities were estimated to be even lower. Based on the
general equilibrium model, upper estimates of the present
value of the gross gain from saving the average permanent job
for five years, is approximately $20,000 per job. For the
average temporary job, saving a man-year of work for five
years, is estimated at most to generate $1,200 per man-year
(and less per worker as more than one worker is associated
with a man-year of employment). These estimates are based on
the assumption that all workers are ultimately sourced from
the temporary sector and that rents are earned by workers
moving from temporary to permanent jobs. This implies that
they are upper estimates of the gross labour benefits.

The strategy of delaying layoffs would seem to be
practical in only two circumstances. The first is where
government assistance is used to phase a firm out of
operation over at most a couple of years in an orderly
fashion. The second is where government assistance is
intended to maintain the existing or converted business for
the foreseeable future. Knowingly maintaining a firm in
operation for some intermediate duration (five years)
can adversely affect the attitude of workers seeking
long-term career development as well as suppliers and
customers seeking long-term contracts. Hence, the business
efficiency of the firm can be adversely affected.

Worker Re-employment Promotion Programs

In the event of a major layoff most manpower programs aim at reducing the private and economic costs of the short-run increment in unemployment which follows. Such programs cover a broad spectrum from job search and counselling to retraining and income maintenance programs. The impact of these programs is usually measured by the change in the speed of re-employment, or by changes in the duration of unemployment. Most of these programs unfortunately fail to deal with some of the longer-run costs of worker displacement.

Analysis of the long-run effects of a program requires· not only an examination of the speed of re-employment, but also an appraisal of the variables that indicate the quality of subsequent employment, such as wage rates and permanency of subsequent jobs. In addition, the second-round effects on the employment prospects of other workers as a result of assisting a limited number of displaced workers should be taken into account in an analysis of the program from an economic perspective.

An example of these wider ranging effects can be found in the so-called "portable wage subsidy" program that has been suggested for inclusion in a trade adjustment assistance package in Canada. In this type of program, subsequent employers of laid-off workers, who have been designated as "trade-affected", would receive wage subsidies for each week of employment provided over a three-year period (say) following layoff. From the perspective of the designated worker, the program can be expected to have positive effects on his employment and income prospects in both the short and long runs. The worker achieves a competitive edge in finding a new job, and he also can anticipate greater job security

because the subsidy payments would be conditional on
continued employment. Employment stability is further
reinforced if the subsidy payments are used to cover
on-the-job training for the worker which increases his or her
value to the firm.

From an economic perspective, however, a number of
indirect effects have to be considered in designing such a
program to ensure that it leads to long-run net economic
benefits, while still assisting those who lose their jobs.
The first concern is the extent to which assisting some
workers adversely affects the employment prospects of other
workers. As long as the trade-affected workers are not close
substitutes for other workers, the wage-subsidy program can
lead to increased employment for all workers through its
expansionary effects. If they are close substitutes,
however, then the adverse indirect effects are proportional
to the relative size of the program. A second concern would
be the differential in the net labour externality that can be
expected to occur in other sectors that offer alternative job
opportunities. The higher the remaining level of trade
protection available to other sectors, for example, the lower
is the value of the marginal economic product of labour in
those sectors and, hence, the lower is the net labour
externality. This would justify making the level of the wage
subsidy inversely related to the degree of remaining trade
protection received by potential new employers. Such a
provision would not encourage employment expansion in the
weaker import-competing sectors.

The gross economic benefits from re-employment promotion
programs, in general, can be measured as the cumulative
present value of the increase in the economic value of the
laid-off workers' time in alternative activities (i.e., by
the increase in the economic opportunity cost of labour to

the cancelled jobs). The increase is estimated by the difference between the incremental economic value of labour in alternative activities with and without the re-employment promotion program.

Job-counselling and search-assistance programs tend to speed up the re-employment of displaced workers. If the program being analysed is an added effort, directed only at displaced workers, then the transitional gains could be measured with the partial equilibrium model. Notice that such a program would provide additional assistance to the laid-off workers to find jobs in their first unemployment spell; their long-run equilibrium employment prospects depend upon their ability to find and retain employment beyond this first job. If the job-counselling and search-assistance programs increase the efforts of all unemployed workers, then the benefits could be captured in the general equilibrium model as a faster adjustment to a new labour market equilibrium as a result of a layoff. Empirical evidence of the actual behavioural effect of such programs on the rates of re-employment are required for realistic estimates of the economic benefits. Sensitivity analysis can be used as a short-run solution to show the range of the magnitudes of the potential gains. As an illustration, estimates of the maximum potential gains were made for workers in the Sherbrooke region of Quebec. It was assumed that a re-employment program was 100 percent effective, i.e., all workers found jobs immediately upon layoff, but that their subsequent employment-unemployment experience was unaffected. Under these ideal conditions the reduction in income loss by the workers was estimated at about $1,000 and the gains to the economy about $3,000 over five years. Clearly no program comes close to being 100 percent effective, and hence, the actual gains (before program costs) would be considerably less.[31]

Relocation assistance programs can be analysed in an analogous manner depending upon the extent of the coverage of the new program: i.e., only displaced or all workers. In the general equilibrium model the effects of a relocation program could be captured by faster migration response rates to labour market disturbances. Although migration forms the major mechanism by which regional labour markets regain their equilibrium relationships with other regional labour markets in the model, it is important to notice that there are limitations to the beneficial effects of relocation programs that merely provide assistance to defray moving expenses. These limitations arise because at any point in time there is only a limited number of workers both inside and outside of a region who are marginal suppliers of labour to a particular region, and relocation programs can be expected to affect the job-location decisions of only those at the margin. The inframarginal workers feel themselves better off in their home region given the perceived differentials in wages, employment prospects, costs of living and environmental attributes (physical and social) among regions. The key thing to notice is that these features that determine the indifference or otherwise of workers between regions are all recurrent costs or benefits, whereas mobility grants affect the fixed one-time costs of moving. For many, if not most, workers the present value of these one-time costs can be expected to be relatively small compared to the perceived differential in recurrent costs and benefits that results in their regional attachment. Mobility grants have to exceed the fixed costs of moving in order to encourage many inframarginal workers to move and, hence, substantially increase the net flows of migrants.

A portable wage subsidy program is expected to result in both short-run and long-run labour externalities. The expected short-run externalities arise from a more rapid

initial re-employment of the subsidized workers. These benefits would be measured in the same manner as the transitional gains of the counselling and job-search-assistance programs using the partial equilibrium model. An additional expected benefit of the program is the creation of a net increment in the man-years of employment offered. These new jobs are expected to be spread across all types of employment and to last the duration of the program (e.g., three years per subsidized worker). The long-run effects on the employment of the subsidized worker himself would be implicit in the general equilibrium estimates of the overall gross labour externality from the program.

Institutional or on-the-job training programs can generate long-run economic externalities by improving the quality of jobs (the wage rate and permanency of jobs) that trainees can expect. To be beneficial, the improvements in the marginal productivity of labour in subsequent jobs has to offset the foregone product of labour during a training period plus the economic costs of the resources devoted to the training program. The largest potential gains from training programs can be captured by directing the training towards increasing the supply of labour categories that are in short-run shortage (see Appendix A). Increasing the supply of labour in a specific skill category that is in excess demand is equivalent to effectively creating a new job in all future periods during which job vacancies requiring this specific skill are expected to persist or the wage rate remains higher than expected. The general equilibrium model can be used to estimate the benefits of such "new jobs." Notice that no labour externality can be credited to the saving of a job that is filled by a worker with skills that are in excess demand because, if he were laid off, he would move immediately into an otherwise unfilled job at the same wage.

NOTES

1. Not all laid-off workers can necessarily be considered as involuntarily entering unemployment. Workers who voluntarily choose to make a career out of seasonal employment, for example, are aware that they will be repeatedly laid off due to lack of work at the end of a season.

2. Much of this movement of labour between states of employment, unemployment, and non-participation has been captured in stocks-and-flows studies of the labour market. See for example Denton et al (1976), Lazar (1977), or McIlveen and Sims (1978). Based on Statistics Canada data for the early 1970s, studies revealed that about 2 percent of the labour force entered unemployment each month in Canada. Statistics Canada data on the Annual Work Patterns of labour in the late 1970s revealed that this turnover rate had risen to over 3 percent, e.g., Postner (1980). Analysis of labour force tracking data has also revealed much of this dynamic nature of the labour market, e.g., Jenkins et al (1978), Jenkins and Montmarquette (1979), and Glenday (1979).

3. Grant and Vanderkamp (1976) estimated annual interprovincial mobility rates of about 2 percent, inter-regional mobility rates of nearly 5 percent and inter-locality rates of over 7 percent during 1965-71, based on tax-payer records. From unemployment insurance and family allowance records Vanderkamp (1973) estimated annual interprovincial mobility rates of closer to 3 percent during the 1965-68 period. Glenday (1979) found from unemployment insurance and records of employment data that during the 1974-76 period over 16 percent of

workers in Ontario and Quebec who experienced some
unemployment had changed regions or province at least
once during these three years. In the same study, it
was found from a sample of workers laid off from the
textile, clothing and electrical product sectors in
1974-76 that about 15 percent changed census districts
between jobs.

4.   From labour force tracking data, the Department of
      Industry, Trade and Commerce (1979) reports that for a
      sample of workers losing their jobs in the clothing,
      textile, and electrical products sectors during 1974-76
      about 84 percent changed sectors, and between 62 percent
      and 90 percent changed occupations between jobs.

5.   Betcherman (1980)

6.   Average wage rates in a number of traded-protected
      industries as a percentage of the average manufacturing
      sector wage in 1976 were: clothing, 65.0 percent;
      knitting, 65.5 percent; leather, 68.5 percent; textiles,
      80.0 percent; and electrical products 97.6 percent;
      Statistics Canada, Catalogue 31-203.

7.   See for example Glenday (1979), Dept. of Industry, Trade
      and Commerce (1979) and Matthews (1980).

8.   The unemployment rates in 1970 are not necessarily
      optimal in any sense. At the same time the notion that
      unemployment rates should be equalized across all
      regions is not useful. Regions differ in terms of their
      environmental ammenities for non-employed time as well
      as their employment structures (such as the degree of
      seasonality of employment). Both factors are expected to
      generate differing unemployment rates across regions.

In fact, Glenday and Jenkins (1981) show surprising
similarities across regions in terms of the experience
of the individuals actually experiencing unemployment
over the period 1972-79. This is particularly true for
the proportion of time in the labour force that
individuals are unemployed and not collecting
unemployment insurance benefits. This similarity
implies that, given the present incentive structure, it
is highly improbable to expect regional unemployment
rates to equilibrate at the same level. Furthermore,
long-run differences in regional unemployment rates
across Canada are well documented. See Denton and Ostry
(1965), Denton et al (1975), and Jenkins et al (1978,
Chap. 2 and Appendix 3). The focus is therefore on the
change in a regional unemployment rate over time rather
than on its level as a measure of the impact of
migration.

9.   Assume that government transfer payments and investment
incentives are used to offset the regional multiplier
effects on secondary employment that changed migration
patterns would produce in the long run.

10. Long-run changes in participation rates have been found
to be surprisingly insensitive to income and wage rate
changes. See Dept. of Finance (1980, Appendix 1).

11. Eligibility to collect unemployment insurance (UI)
varies with regional unemployment rates. For example,
since 1978 a worker in a region with a 12 percent
unemployment rate (not uncommon in many regions in the
Atlantic Provinces) would be eligible to collect UI
benefit for 32 weeks longer than a worker becoming
unemployed in a region with a 4 percent unemployment
rate (not uncommon in many regions of the Prairie

Provinces). Furthermore, the worker in the 12 percent region could work for four weeks less to establish this eligibility. See Statistics Canada, Catalogue 73-001 (Quarterly).

12. If workers require only employment prospects of working a proportion, P, of the time in order that they are willing to supply labour to a regional labour market, then if one man-year of additional work is provided, this will attract 1/P aditional workers, and hence, generate (1/P - 1) additional man-years of unemployment. See Jenkins and Kuo (1978).

13. See, for example, Betcherman (1980).

14. Faster response time to an imminent skill shortage can be gained by changing the use of the existing stock of workers (more overtime) or increasing the stock by decreasing the outflows (incentives not to retire).

15. If the rate of supply of newly trained workers is inflexibly constrained by a fixed number of positions in formal institutions, then the effects of even a one-time demand shock may persist for an extended period.

16. The loss of pension benefits or, at least, the employers contribution to these, is expected to be higher for older workers. Unfunded pensions or non-profitable pension schemes result in such losses to laid-off workers. Older workers may also be discriminated against in alternative jobs as it is more likely that they will retire and have to be paid pensions than younger workers.

17.   In 1978, excluding self-employed and family workers,
      private pension plans covered 44.1 percent of the labour
      force, 49.7 percent of employed persons and 53.8 percent
      of full-time employed persons.   See Statistics Canada,
      Catalogue 74-401.   With non-portability of pension
      contributions laid-off workers, particularly older
      workers, can face a loss in wealth.   To the extent that
      future employers see older workers as a greater pension
      liability than younger workers, this can result in older
      workers having greater difficulty in being rehired.

18.   Supplemental unemployment benefit provisions are common
      in labour contracts of workers in some cyclically
      sensitive industries.   These payments are intended to
      top up the normal unemployment insurance benefits during
      a temporary layoff.   In 1978 the sectors with the
      highest percentages of wage earners covered were
      transportation equipment, 60.7 percent; transportation,
      communication and other utilities, 30.1 percent; durable
      goods, 23.2 percent; and mines, quarries and oil wells,
      11 percent.   Among salaried workers the percentages
      covered in these same sectors were 16.7 percent, 4.19
      percent and 10.0 percent.   (Source: Tabluations provided
      by Statistics Canada, Employee Compensation in Canada.)
      From Dept. of Employment and Immigration records for May
      1978, for companies with Supplemental Unemployment
      Benefit Plans it was found that these were concentrated
      in the transportation equipment sectors (automobiles,
      trucks, farm equipment, aircraft and parts, especially
      tires), transportation service sector (railways,
      termials, longshoremen, etc.), breweries, and the cement,
      steel, and aluminium sectors.

19.   In 1978 severance pay provisions covered 50.1 percent of
      salaried workers and 29.4 percent of wage-earners, with

public administration being the sector with the highest
coverage (70.8 percent, 63.2 percent). (Source:
Tabluations provided by Statistics Canada, Employee
Compensation.) Typically, severance payments are
approximately one week's pay per year worked with some
maximum payment provision and some minimum years worked
required to qualify for payments.

20. A distinction can be drawn between the established
isolated community where people have lived for a number
of generations and the more temporary isolated community
where the expectation of having to move out at some
point is well developed. In the latter situation the
employer may well own the housing stock to insulate the
workers from the risk of capital loss. This may also be
the situation where a small community is dependent on
some cyclically sensitive industry. Workers would be
reluctant to bear the full risk of a highly probable
layoff.

21. For example, in 1979 the 22 major urban areas,
labour market statistics of which are separately
reported each month, constituted 59 percent of the
Canadian labour force. See Statistics Canada, Catalogue
71-001.

22. To illustrate the effects of the trend growth rate of
employment and labour market size (or the relative size
of the layoff) on the time it takes employment in the
region to recover to its pre-layoff level a few
hypothetical cases are given. Consider a major
permanent layoff of 1,000 base sector workers in regions
in which the long-run proportion of employment provided
by the base sector is assumed to be 50 percent. For a
small region (10,000 jobs) with a slow growth rate of

employment (1 percent per year), the recovery time is 20
years assuming no offsetting price-effects attracting
new investment into the region faster after the layoff.
If the growth of employment is fast (5 percent per year)
in this small region, then the recovery time drops to
four years. In a large region (100,000 jobs) with slow
growth rate, the recovery time is only two years, and if
the growth rate of employment is fast, then the recovery
time drops to less than half a year.

23. See Glenday (1979), Glenday and Jenkins (1981a).

24. For weak trade-protected sector wage rates, see note 6.

25. For occupational and industrial mobility, see Dept. of
Industry, Trade and Commerce (1979).

26. Income-loss estimates here exclude any severance
payments, part-time earnings during unemployment spells
and mobility grants or tax-deductions for moving, (all
of which would reduce the loss estimates), and any
changes in fringe benefits or added ex ante cost of
risks (which would tend to raise the loss estimates).
These estimates also assume that changes in wage rates
do not represent compensation for changes in work
conditions between jobs or the amenity value of location
between regions for those who move. For example, a
worker may be willing to accept a lower wage rate in a
job with improved work conditions or good growth
prospects, but may require a higher wage to induce him
to move or take a job with worse work conditions. All
added benefits should be added to his subsequent income
while the added costs should be subtracted. Estimates
based on the assumption of the same wage level before
and after job loss are neutral to these latter
considerations.

27. See Glenday (1979), and Glenday, Jenkins and Evans (1980 a and b).

28. See Jenkins et al (1978), Jenkins and Kuo (1978), Jenkins and Montmarquette (1979), and Glenday, Jenkins and Evans (1980 a and b).

29. In the case of trade liberalization, for example, a worker faces some finite probability of being laid off at some future date even if the government maintains or increases the level of trade protection.

30. See Glenday, Jenkins and Evans (1980 a and b).

31. See Glenday, Jenkins and Evans (1980 a and b).

Appendix

THE NET LABOUR BENEFITS FROM MARKET INTERVENTIONS:
ADJUSTMENT VERSUS LONG-RUN GAINS FROM ADDITIONAL TRAINING

This appendix aims to present the simple analytics of estimating the gains from intervening in a labour market to improve the labour supply in a situation of expanding demand. Where a market is growing rapidly in its demand for labour in general or for labour with specific skills, adjustment problems are recognized by labour supply shortages developing at the going wage rates. Wage rates start to rise as firms attempt to bid away workers from their current employers or firms start increasing their recruitment and training activities to meet their labour demands at the prior going wage, or make use of their existing skilled employers by paying for overtime or discouraging retirement.[1] This increase in costs of hiring labour will dampen other firms demands for this type of labour in the short run. The combined effects of the firms' recruitment and training efforts and the additional wage incentives to new workers to supply their labour would be expected to result in the market equilibrating back at a wage rate close to its prior level in the long run depending upon the slope of the long-run labour supply curve.

The essential feature of this adjustment process of the market regaining its long-run equilibrium is that workers and firms have to undertake unexpected and, hence, delayed investments to take advantage of the growth in demand beyond its otherwise expected equilibrium level. These investments may include search costs, migration costs or training costs, or in other words commitments of capital and time.

The potential source of net economic gain from government interventions arises from the delay in taking advantage of the unexpected new market opportunities. The

economic gain from more rapid adjustment arises out of the
present value of the reduced delay in capturing the market
benefits, vis., the surplus and the labour market
externalities associated with the expansion of activity.

Interventions to promote the pace of the adjustment
process in order to capture labour market benefits should be
distinguished from situations in which the government
intervenes to alter the long-run market equilibrium in order
to capture external benefits. The government, however, may
attempt to alter both the adjustment speed and the
equilibrating level of employment in a market.

To be more explicit about the source of both the
short-run adjustment and the long-run economic gains, a
stylised example of labour training and skill shortage is
presented. Consider an economy with two types of labour,
skilled and unskilled, in which the net-of-tax differential
between the skilled labour wage rate (w^{sn}) and the
unskilled labour wage rate (w^{un}) is just sufficient so
that the present value of this differential earned over a
working lifetime covers the private costs of undertaking the
training to become a skilled worker. As long as at least
this wage gap persists the supply of skilled labour can be
taken as being infinitely elastic in the long run, if the
supply of unskilled labour is infinitely elastic. Initially
the skilled labour market is taken to be in equilibrium,
i.e., the supply and demand for skilled labour are growing at
the same rate which implies that sufficient workers are
anticipating the market growth and undertaking the required
training. At some point in time the demand for skilled
labour in terms of w^{sw} is given by demand curve D_0^n
(see Figure A.1) and w_0^{sw} the level of employment is
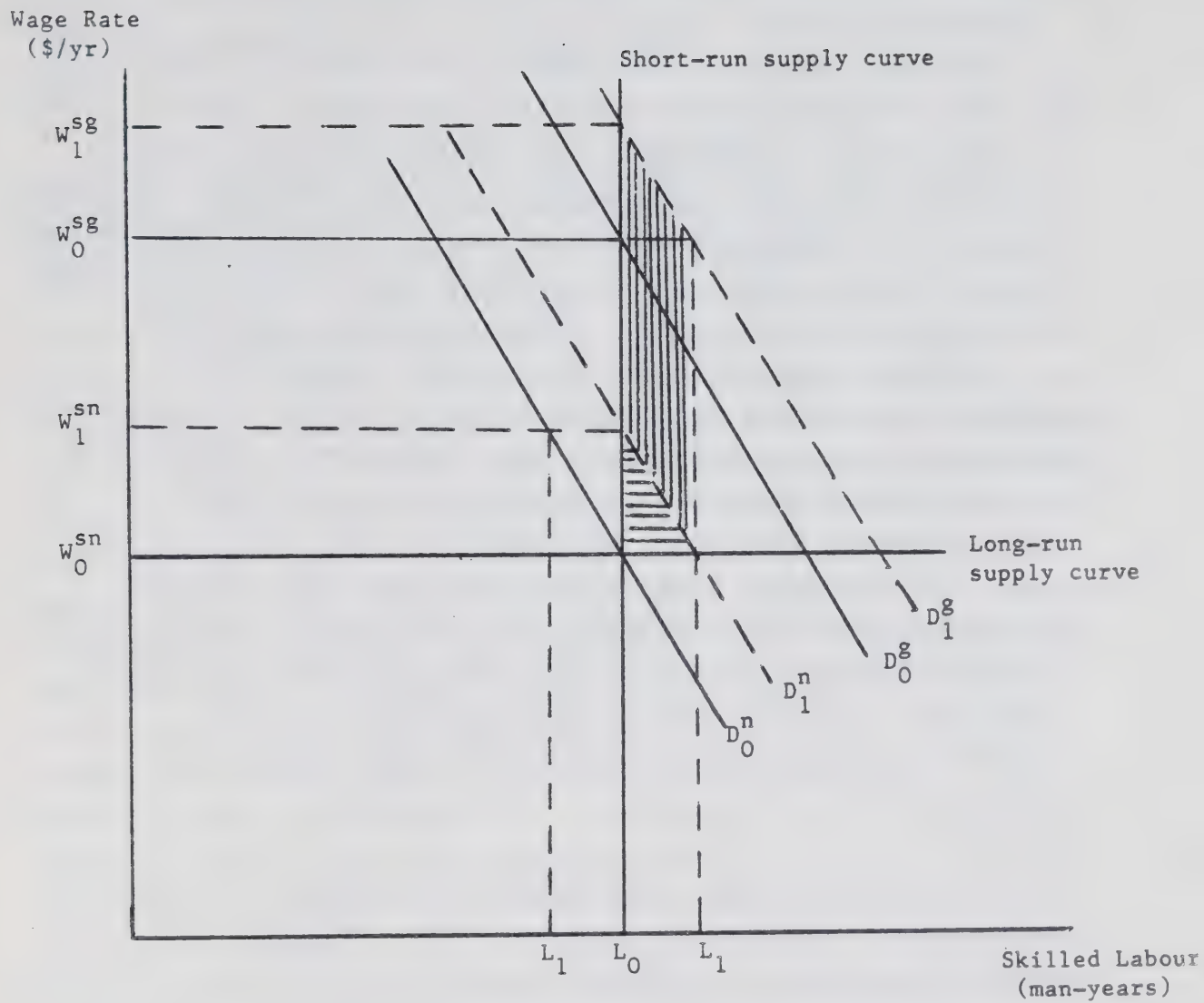L_0. The value of the marginal product of skilled

Figure A.1   Skilled Labour Adjustment to increase demand

labour, gross of all externalities (income and sales taxes, say), is given by demand curve $D_0{}^g$. At L_0 the marginal economic value of skilled labour is therefore $W_0{}^{sg}$.

Now an unexpected increase in the growth in the demand for skilled labour occurs shifting the demand curves outwards to $D_1{}^n$ and $D_1{}^g$. Alternatively, if the supply of skilled workers depends upon the number of places available in formal training institutions, and these are not expanded fast enough to meet the growth in demand, then a gap can develop between supply and demand at $W_0{}^{sw}$. This results in the short-run in wage rates being bid up to $w_1{}^{sw}$ to clear the market if the short-run supply curve is taken to be perfectly ineslastic, or in other words, the incremental demand for skilled labour ($L_1 - L_0$) is being met by this labour being bid away from other employers who cut back to L_1 at $w_1{}^{sn}$. This implies that in the short run the economic opportunity cost of employing this incremental labour is the foregone economic value of the labour bid away from other employers. This is $w_0{}^{sg}$ at the margin or about $\frac{1}{2}$ ($w_1{}^{sg} + w_0{}^{sg}$) per man-year for large changes in labour demand.

Now the increased gap between the net-of-tax wages for skilled and unskilled workers attracts the additional unskilled workers to undertaking training and after some time (T), which is assumed here to equal the training time, to supply themselves to the market bringing it back to its long-run equilibrium at $w_0{}^{sn}$ and L_1. Hence, in the long run employment expands by (L_1-L_0) as the wage rate drops to $w_0{}^{sn}$ again. Each added man-year of labour employed now generates an externality or labour benefit equal to ($w_0{}^{sg}-w_0{}^{sn}$) or for all (L_1-L_0), the vertically matched area in Figure A.1 per year. In the longrun the economic opportunity cost per man-year of added skilled labour

is w^{un} plus the added training costs, or $w_0{}^{sw}$. The labour
supply side is assumed to be undistorted. The lowering of
the wage rate from $w_1{}^{sn}$ to $w_0{}^{sn}$ also results in a gain in
surplus equal in value to the horizontally matched triangle
from the increased use of skilled labour at the lower wage
rate.

This change between the short and long runs in the
economic opportunity cost of meeting the unexpected demand
for an additional man-year of labour is captured in Figure
A.2. Up to time T from the onset of the shortage of skilled
labour, the economic opportunity cost equals the economic
value of the marginal product of (L_1-L_0), i.e., $\frac{1}{2}(w_1{}^{sg} +
w_0{}^{sg})$, while in the long run, after time T where the additional
workers have been trained, the economic opportunity cost drops
to $w_0{}^{sw}$. During this latter period a labour externality
equal to $(w_0{}^{sg}-w_0{}^{sn})$ is generated. If the growth in the
demand for skilled labour had been fully expected, the long-run
equilibrium would have been reached virtually instantaneously.
This implies an additional labour benefit of $[\frac{1}{2}(W_1{}^{sg}+W_0{}^{sg})-
w_0{}^{sn}] (L_1-L_0)$ per year during during period T, or in other
words, the economy would be better off by the present value
(PV) of area A in Figure A.2. It is this gross benefit, PV
(area A), which gives the maximum potential for gross economic
gains through government intervention, speeding up the labour
adjustment process, i.e., decreasing the delay, T, in reaching
the new long-run equilibrium. The _net_ economic benefit would
be the present value of the additional labour benefits (PV
(area A) at a maximum) minus the present value of the economic
opportunity cost of the resources that the government would
devote to achieving this faster adjustment. Hence, the gross
economic gains from government intervention increase the larger
the labour market distortion $(w_0{}^{sg}- w_0{}^{sn})$, the larger
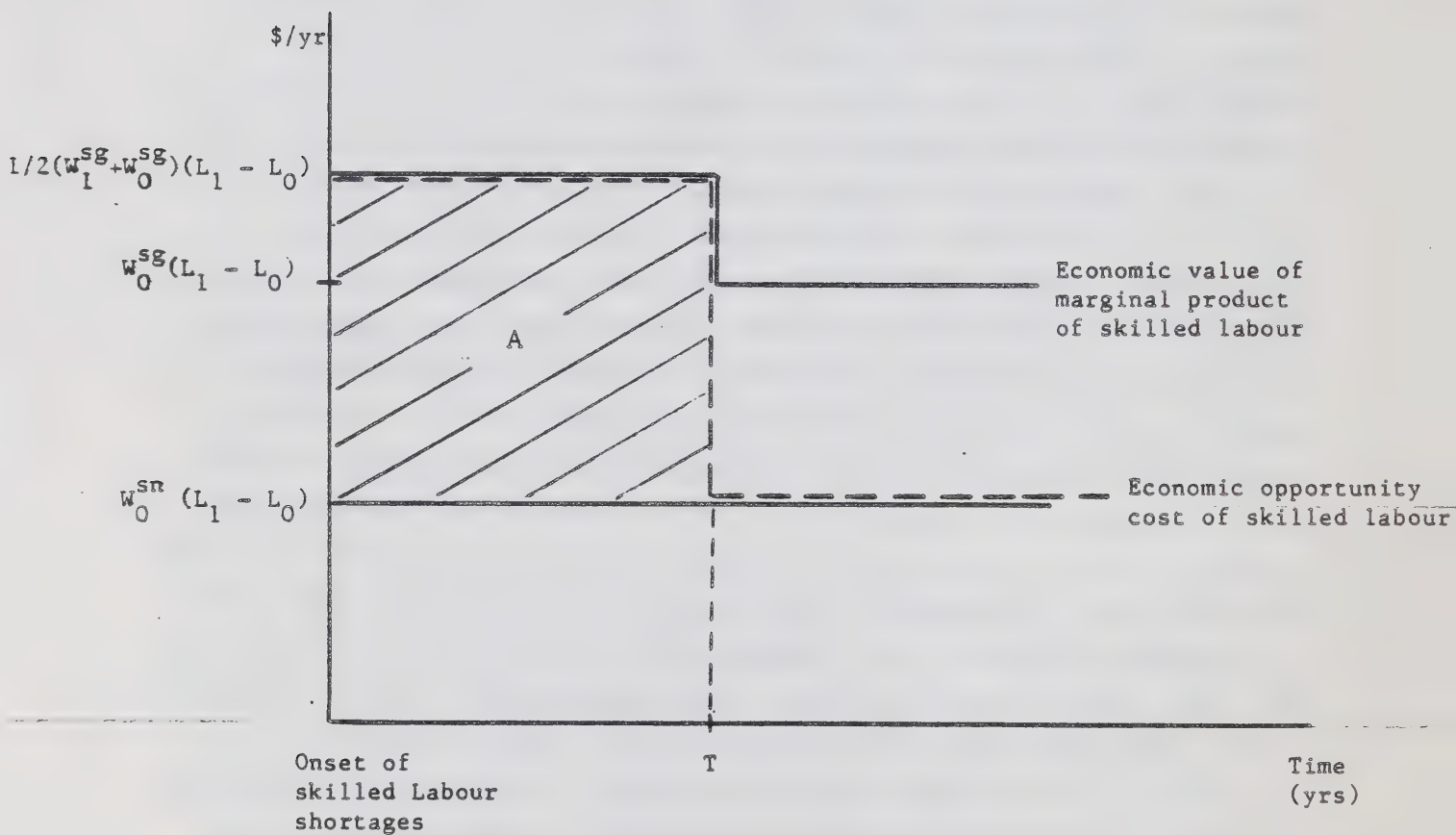the shortage $(L_1 - L_0)$, the larger wage increase the

$$\$/yr$$

$$1/2(W_1^{sg}+W_0^{sg})(L_1 - L_0)$$

$$W_0^{sg}(L_1 - L_0)$$

Economic value of
marginal product
of skilled labour

A

$$W_0^{sn} (L_1 - L_0)$$

Economic opportunity
cost of skilled labour

Onset of
skilled Labour
shortages

T

Time
(yrs)

Figure A.2   Potential gains from promoting
skilled labour adjustment.

$(w_1{}^{sg}-w_o{}^{sg})$, the longer it takes the normal
operations of the market to regain long-run equilibrium (T),
and the more cost-effective any government intervention is at
reducing the delay (i.e., the lower the economic cost per
year of reduced delay.) Long delays in regaining equilibria
are more likely where lengthy training is required or demand
growth is accelerating and, hence, outpacing supply growth.
In this latter case the delay in regaining the long-run
skilled labour market equilibrium can exceed the time, T,
taken to train an additional worker.[2]

Aside from regulating international migration, two basic
approaches are open to the government to promote the labour
adjustment process in the face of skill shortages: active
participation or structuring private supply incentives. The
former approach implies that the government actively collects
labour market information, predicts likely shortage areas and
disseminates this information to encourage persons to train
to meet the anticipated shortage and/or direct its training
expenditures into the appropriate skill areas. The
alternative approach is to set up the incentives (i.e.,
conditions for receiving government funding) for training
institutions to encourage them to follow labour demand trends
more actively and to align their training cirricula to
current and expected labour market demands. Tying funding to
placement records can have this effect. Improved labour
market demand anticipation and training service supply
flexibility are the key elements to reducing labour market
adjustment time.

It is important to distinguish the potential short-run
economic gains from promoting labour adjustment from those
that can be derived from changing the structure of market
incentives to capture long-run economic benefits. The
existence of a distortion in labour results in a lower level

of employment than would otherwise be the case. For example, in Figure A.1 the undistorted demand for labour is given by $D_O{}^g$ which implies a higher level of employment at any net-of-tax wage rate than $D_O{}^n$. Given the distortion in the skilled labour market, labour benefits could be gained by subsidizing wage rates or reducing the costs of training. For example, if the government subsidized wage rates by $(w^{sn}-w^{un})$ per year (or alternatively reduced the private costs of training to zero in this hypothetical case), then the equilibrium employment level of skilled labour would move to $L_1{}^s$. See Figure A.3. The net economic gain in the skilled labour market would be the economic value of the added labour employed (the area under $D_O{}^g$ between L_O and $L_1{}^s$) minus the economic opportunity cost of this added employment (the area under the long-run supply curve) which gives a benefit per year equal to the shaded area in Figure A.3. Notice that a marginal wage or training subsidy (i.e., a subsidy on the incremental skilled workers or trainees) would be more efficient in that less tax revenues would have to be raised or a lower government deficit would be incurred thereby lowering the economic cost of the expenditure.

Marginal wage or training subsidies can be used to capture both the short-run adjustment benefits and the long-run expansion labour benefits. To affect any adjustment gains the marginal subsidies would have to be increased in anticipation of the shortage. Furthermore, to the extent that a marginal wage subsidy was targetted at the employment of some specific skill group in which the skill was acquired by on-the-job training, it should be made available to trainees as well as qualified workers employed by a firm, otherwise in a shortage situation a firm would first have to bid away a trained worker from another firm to be eligible to receive the subsidy which it would then use to cover the costs of training an additional worker.
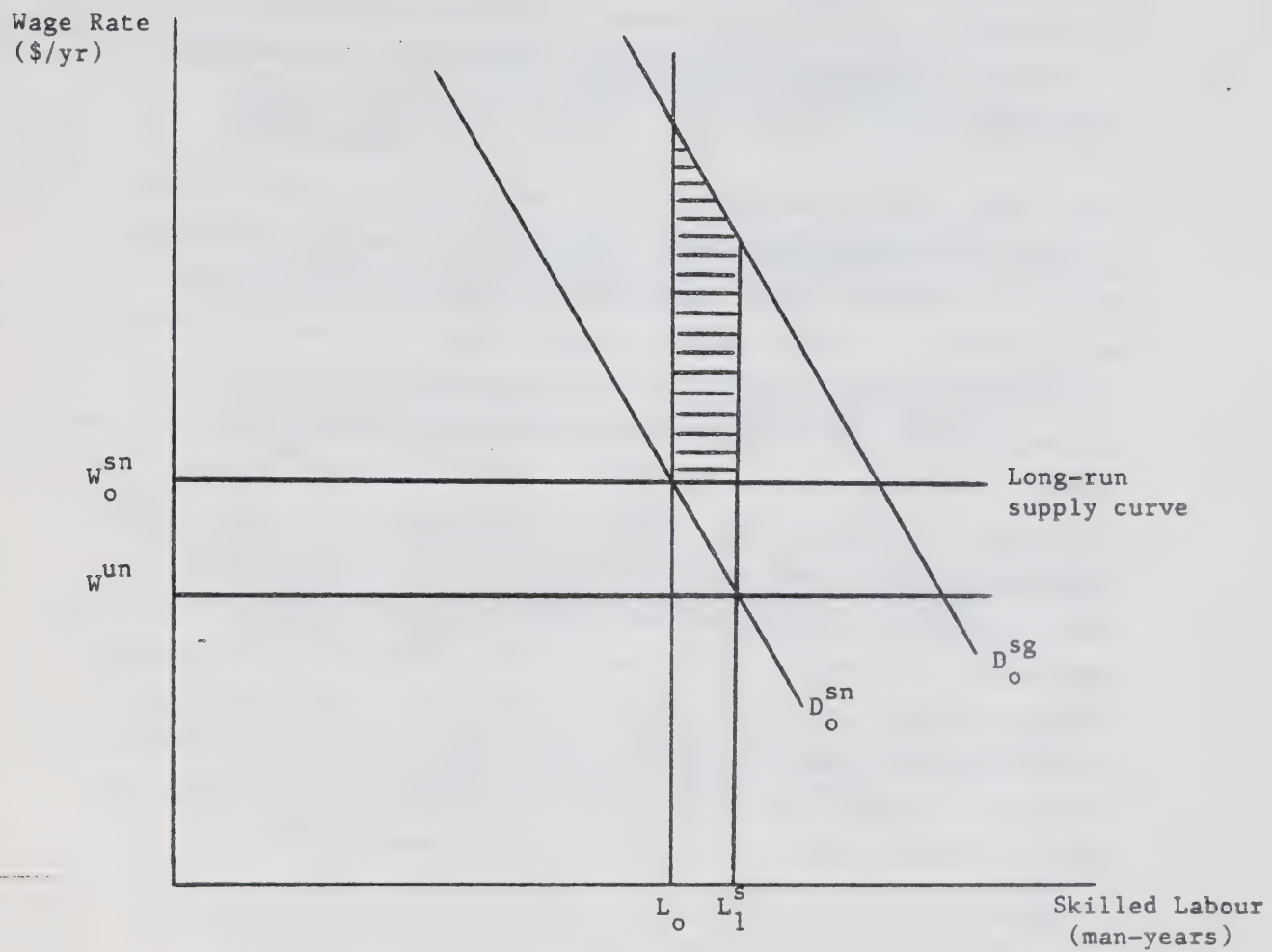
Figure A.3   Long-run Economic gains for subsidizing
skilled labour

Notes to Appendix

1. Large firms already hiring a significant number of workers with the skill in short supply are more likely to undertake added search or training to acquire additional workers than to bid workers away from other firms. Increasing the wage rate they have to pay marginal workers can result in large increases in the total wage bill if all their inframarginal workers also receive the wage increase.

2. This model could be made more complex in attempting to capture the gross economic benefits of decreasing the delay in reaching the long-run skilled labour market equilibrium. Other labour market distortions could be recognized in the skilled labour market (e.g., unionization and unemployment insurance benefits), in the product market (e.g., tariffs), and in other factor markets affected (e.g., foreign exchange externalities). Furthermore, if the bidding up of wage rates actually resulted in the contraction (rather than merely the slower expansion) of other firms using this labour, then there would be additional downside adjustment costs over and above the foregone externalities. The infinitely elastic long-run supply curve and perfectly inelastic short-run supply curves are also not necessary assumptions.

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